

State of California
Business, Transportation and Housing Agency
Department of Transportation

POLICY MATTERS
Report on Seismic Safety Retrofit Program
Information Item

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Agenda Item: 4.3 - REVISED

Original Signed by _____

W. J. EVANS
Chief Financial Officer
May 2, 2001

ANNUAL REPORT ON
SEISMIC SAFETY RETROFIT PROGRAM

This report discusses the progress of our program for the seismic safety retrofit of publicly owned highway bridges through the end of 2000. The Seismic Retrofit Bond Act of 1996 (Proposition 192), which was approved by the voters at the March 26, 1996 direct primary election, requires the Department of Transportation (Department) to report annually on the status of funds available for seismic retrofit projects and the expenditures of bond proceeds.

The Department of Transportation Seismic Safety Retrofit program consists of four areas: Phase 1, Phase 2, Toll Bridges, and the Local Program. Proposition 192 provides funding for Phase 2 and Toll Bridge projects. Even though Phase 1 and Local Program improvements are funded from other sources, all four program areas are included in this report to provide a comprehensive view of the Department's entire Seismic Safety Retrofit Program.

Phase 1 Seismic Retrofit Program:

- Phase 1 Seismic Retrofit projects consist of a total of 1,039 bridges. All 1,039 bridges have had seismic safety retrofit work completed. The Phase 1 seismic retrofit work was completed in May 2000. There are four follow-up landscape mitigation contracts remaining to be completed.
- Phase 1 consists of bridges that were determined to be the most critical bridges for seismic retrofit based on the Department's screening process. The total estimated cost for Phase 1 is \$1.08 billion. Phase 1 projects have been funded from the State Highway Account through the State Highway Operation and Protection Program (SHOPP). The total expenditures to date are approximately \$1.07 billion. The remaining balance of \$10 million should be sufficient to complete the Phase 1 program.

Phase 2 Seismic Retrofit Program:

- Phase 2 consists of bridges that were determined to need seismic retrofit based on the Department's additional screening process. The total budget for Phase 2 is \$1.35 billion. The funds include \$1.21 billion in Proposition 192 funds and \$140 million in State Highway Account funds (expenditures prior to passage of Proposition 192). A total of \$1.023 billion has been allocated for Capital Outlay and Support costs.
- Phase 2 Seismic Retrofit projects consist of a total of 1,155 bridges. A total of 1,132 bridges (representing 98.0 %) have had seismic safety retrofit work completed. Phase 2 has nineteen bridges remaining in design and four bridges under construction. The remaining bridges will be completed at various times over the next few years. There are three major bridges that will replace existing bridges while accommodating existing traffic. These bridges will not be completed until after the year 2005, depending on the final traffic handling conditions.

Toll Bridge Retrofit Program:

There are nine State-owned toll bridges. Seven of the nine toll bridges require seismic retrofit. At this time there are cost issues with the Toll Bridge Retrofit Program. Recently a report titled, "Toll Bridge Seismic Retrofit Program Annual Report" was submitted to the Legislature that discusses the cost issues in more detail. This report was distributed to the Legislature in April of 2001. The report cover is attached for reference. The report is available for viewing at the following internet website address: <http://www.dot.ca.gov/hq/transprog/ctcliaison.htm>

- In addition to the San Francisco-Oakland Bay Bridge (SFOBB), there are six bridges requiring seismic retrofiting. There are a total of twelve seismic retrofit contracts on these six bridges. Of the twelve contracts, six have been completed, and six are under construction.

To date, two of the toll bridges have been completed:

- (1) San Mateo – Hayward, Completed: May 2000.
- (2) Vincent Thomas, Completed: May 2000.

The other bridges are under construction and the estimated completion dates are:

- (3) Richmond -San Rafael, awarded October 6, 2000. Completion: Summer 2005
- (4) Benicia – Martinez, Completion: Summer 2001
- (5) Eastbound Carquinez, Completion: Spring 2001. The Westbound Carquinez Bridge will be replaced by a new bridge to be funded by Regional Measure 1.
- (6) San Diego – Coronado, Completion: Winter 2002

- The San Francisco-Oakland Bay Bridge (SFOBB) consists of two major spans, the West and East span. The SFOBB West span currently has a total of eight contracts. Three contracts are completed, three are under construction, one is advertised, and one is in design. The West span retrofit should be completed in the Winter of 2008. The SFOBB East span new bridge is currently being designed and the environmental document is being finalized. The East span bridge is planned to be completed by the end of 2006.

Local Seismic Retrofit Program:

- The Streets and Highways Code identifies the Department, Los Angeles County, and Santa Clara County as lead agencies for the Local Seismic Retrofit Program. Lead agencies are responsible for assessing the need for seismic retrofit work on non-State, publicly owned bridges and identifying required retrofit work. Each bridge owner is responsible for securing environmental approvals, right-of-way clearances, and administering construction contracts. A combination of Federal and State funding is used to fund these projects through the Department's Local Assistance programs.
- The Department as Lead Agency: (73% of Local Program). Out of a total of 882 bridges, 290 are being evaluated, 268 are in design, 79 are under construction, and 245 are complete or do not require retrofit.
- Los Angeles as Lead Agency: (24% of Local Program). Out of a total of 286 bridges, 33 are being evaluated, 46 are in design, 22 are under construction, and 167 are complete or do not require retrofit.
- Santa Clara as Lead Agency: (3% of Local Program). Out of a total of 36 bridges, 2 are being evaluated, 34 are complete or do not require retrofit. There are no bridges in design or construction.
- Total Local Agency Program: Out of a total of 1,204 bridges, 325 (27%) are being evaluated, 314 (26%) are in design, 101 (8%) are under construction, and 464 (39%) are complete or do not require retrofit.

Attachments

**SUMMARY STATUS
FOR THE SEISMIC RETROFIT OF LOCALLY OWNED BRIDGES**

DESIGN AGENCY	BRIDGES COMPLETE OR NOT REQUIRING RETROFIT February 1998	BRIDGES COMPLETE OR NOT REQUIRING RETROFIT February 1999	BRIDGES COMPLETE OR NOT REQUIRING RETROFIT February 2000	BRIDGES COMPLETE OR NOT REQUIRING RETROFIT February 2001
Los Angeles County	51* out of 287 (18%)	133* out of 286 (47%)	154* out of 286 (54%)	167 out of 286 (58%)
Santa Clara County	28 out of 33 (85%)	31 out of 35 (89%)	31 out of 36 (86%)	34 out of 36 (94%)
Caltrans	102 out of 794 (13%)	143 out of 878 (16%)	190 out of 878 (22%)	245 out of 882 (28%)
Total	181 out of 1114 (16%)	304 out of 1199 (25%)	375 out of 1200 (31%)	446 out of 1204 (37%)

* An adjustment was made to revise LA County figures. Previously, 18 bridges were reported as being complete that were not. These figures have been corrected, and will differ from prior year reports.

TOLL BRIDGE SEISMIC RETROFIT FUNDING			
(\$\$ in millions)			
Source of Funds	Amount	Allocated to date	Balance
Proposition 192	\$790	\$787.5	\$2.5
<u>Toll Bridge Seismic Retrofit Account</u>			
Reginal Share:			
Bay Area Surcharge Revenues*	\$907	\$375.2	
SANDAG Contribution	\$33	\$27.2	
Vincent Thomas Bridge Contribution	<u>\$15</u>	<u>\$0.0</u>	
Subtotal	\$955	\$402.4	\$552.6
State Share:			
State Highway Account	\$795		
Public Transportation Account	<u>\$80</u>		
Subtotal	\$875	\$241.2	\$633.8
<i>Total State and Regional Share</i>	\$1,830		
TOTAL FUNDS AVAILABLE	\$2,620	\$1,431	\$1,188.9

*Funds Expended to date: \$990 million

SUMMARY STATUS FOR THE SEISMIC RETROFIT OF TOLL FACILITIES

TOLL FACILITY	ORIGINAL CONSTRUCTION COMPLETE DATE	CONSTRUCTION COMPLETE DATE AS OF 2/98	CONSTRUCTION COMPLETE DATE AS OF 2/99	CONSTRUCTION COMPLETE DATE AS OF 2/00	CONSTRUCTION COMPLETE DATE AS OF 2/01	NUMBER OF QUARTERS CHANGED SINCE LAST YEAR'S REPORT
SAN FRANCISCO-OAKLAND New East Bay Skyway West Bay Spans	Winter 2004 Fall 2003	Winter 2003 Fall 2003	Fall 2004 Spring 2005	Summer 2005 Spring 2007	Fall 2006 Winter 2008	5 Quarters 3 Quarters
BENICIA-MARTINEZ	Summer 1999	Spring 2000	Summer 2001	Summer 2001	Summer 2001	No Change
SAN MATEO-HAYWARD	Fall 1999	Fall 2001	Fall 2000	Spring 2000	Spring 2000	No Change
RICHMOND-SAN RAFAEL	Fall 2000	Summer 2001	Fall 2003	Winter 2004	Summer 2005	2 Quarters
CARQUINEZ Westbond Eastbond	Fall 2001 Winter 1999	Fall 2002 Summer 2000	Fall 2002 Summer 2000	Fall 2004* Spring 2001	Fall 2004* Spring 2001	No Change No Change
VINCENT THOMAS	Winter 1999	Winter 1999	Summer 1999	Spring 2000	Spring 2000	No Change
SAN DIEGO-CORONADO	Fall 1999	Summer 2001	Winter 2002	Winter 2002	Winter 2002	No Change

Summer June 20 - Sept. 19 or approximately the first quarter of the Fiscal Year
 Fall Sept. 20 - Dec. 19 or approximately the second quarter of the Fiscal Year
 Winter Dec. 20 - March 19 or approximately the third quarter of the Fiscal Year
 Spring March 20 - June 19 or approximately the fourth quarter of the Fiscal Year

* The Retrofit of the Westbound Carquinez Bridge will be accomplished by a new bridge to be constructed by Regional Measure 1.



**CALIFORNIA DEPARTMENT OF
TRANSPORTATION**

**TOLL BRIDGE SEISMIC RETROFIT PROGRAM
ANNUAL REPORT**

**for the
LEGISLATURE AND GOVERNOR**

April 2001

MARIA CONTRERAS-SWEET
Secretary
Business Transportation and
Housing Agency

JEFF MORALES
Director
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April 5, 2001

Members, California Legislature
State Capitol
Sacramento, CA 95814

Dear Members:

In 1997, Senate Bills (SB) 60 and 226 were signed into law establishing a program and funding for the seismic retrofit of seven State-owned toll bridges, including replacement of the East Span of the San Francisco Oakland Bay Bridge (SFOBB).

Under the provisions of SB 60 and SB 226, California Department of Transportation (Caltrans) was given the responsibility and authority to implement seismic retrofits on six of the bridges. The exception is the SFOBB. Under the statute, the responsibility for selecting a final design was placed with the Metropolitan Transportation Commission (MTC), with Caltrans responsible for constructing the selected design.

Senate Bill 60 and SB 226 assumed that the entire program would proceed without delay, and did not incorporate the customary contingencies and inflationary escalators associated with major capital programs. The legislation did, however, include a provision for additional funding beyond the \$2.6 billion provided initially, and required the California Department of Transportation (Caltrans) to notify the Legislature when such a need arose.

The accompanying report explains the program's need for additional funding, as anticipated in the original legislation. The report, which is required annually, has been delayed while Caltrans compiled new cost estimates and provides specific information on the costs of each of the seven bridges. Two major factors account for the necessity for additional funding. First, the strong economy and boom in construction have combined to increase costs significantly. According to the Federal Highway Administration, bridge construction costs have jumped by 18 percent in the last year alone. As noted earlier, SB 60 and SB 226 did not anticipate such increases. Second, more than two years of delays in selecting a final design for the SFOBB are resulting in dramatic cost increases for that project. Although a final design is not yet complete and the necessary environmental clearances are yet to be

obtained because of that delay, Caltrans is projecting that the final cost will be far in excess of the amounts assumed in the legislation.

The increased costs associated with the Seismic Retrofit Program can be broken into two categories: those associated with the six bridges under the control of the State; and those associated with the delayed regional process of selecting the design for the new East Span of the SFOBB.

Caltrans has included in the enclosed report recommendations for addressing the increased costs associated with retrofitting the first six bridges, and proposes a regional solution for the SFOBB costs.

Caltrans has worked diligently to implement the Seismic Retrofit Program, and remains committed to completing the prescribed work as quickly as possible. We look forward to prompt resolution of the funding issues, and to providing the public with the full benefit of improved safety on all of the State's toll bridges.

Sincerely,



JEFF MORALES
Director

TOLL BRIDGE SEISMIC RETROFIT PROGRAM
ANNUAL REPORT

Purpose:

Senate Bill 60 (SB 60), Chapter 327, Statutes of 1997 and Senate Bill 226 (SB 226), Chapter 328, Statutes of 1997 put forth the decision making authority and financing for the Toll Bridge Seismic Retrofit Program (Program). The purpose of this report is to provide information on the Program. This report includes revenue and expenditure information as of December 30, 2000. Cost estimate and schedule information is as of January 31, 2001. This report is intended to meet the reporting requirements of Section 188.5(c)(2) of the Streets and Highways Code (S&H Code).

Background:

On October 17, 1989, the Loma Prieta earthquake (magnitude 7.1) struck the San Francisco Bay Area, resulting in 62 deaths and leaving 8,000 people homeless. The epicenter of the Loma Prieta earthquake was approximately 60 miles away from the San Francisco-Oakland Bay Bridge (Bay Bridge).

Despite the distance from the epicenter the Loma Prieta Earthquake damaged the Bay Bridge. The damage to the Bay Bridge included collapse of the upper and lower decks spanning pier E9 and failure of the bolts at the top of many support towers, threatening additional multi-span collapse with resulting catastrophic loss of life. The bridge was closed for four weeks while the damage was repaired.



The Department of Transportation (Department) initiated research projects soon after the Loma Prieta Earthquake to better understand the vulnerabilities of the State-owned toll bridges, since they are very complex, unique structures. These research contracts with the University of California, numerous private consulting firms, and the Lawrence Livermore National Laboratory were intended to assess vulnerability and need, not to produce contract plans, specifications and estimates.

On November 6, 1989, then-Governor George Deukmejian created a Board of Inquiry (Governor's Board) to investigate the collapse of the Cypress Structure of Interstate 880 and the East Span of the Bay Bridge. The Governor's Board was made up of eleven experts in the field of civil, structural, seismic earthquake engineering and design, and earthquake science. The Governor's Board was chaired by Dr. George Housner of the California Institute of Technology.

The Governor's Board made eight recommendations to the Governor, five dealing with the retrofit of toll bridges. These five recommendations are as follows:

- Affirm the policy that seismic safety shall be a paramount concern in the design and construction of transportation structures;
- Establish that earthquake safety is a priority for all public and private buildings and facilities within the State;
- Prepare a plan including schedule and resource requirements to meet the transportation seismic performance policy and goals established by the Governor;
- Form a permanent Earthquake Advisory Board of external experts to advise the Department on seismic safety policies, standards, and technical practices; and
- Ensure that the Department' seismic design policies and construction practices meet the seismic safety policy and goals established by the Governor.

In response to the Governor's Executive Order D-86-90 (June 2, 1990), the Seismic Advisory Board (SAB) was formed. The SAB advises the Department on seismic safety policies, standards, and technical practices. The SAB consists of preeminent experts in seismology, geotechnical engineering, and structural engineering from the earthquake engineering community and academia. The SAB continues to perform its specified role as it relates to the seismic retrofit of the State's toll bridges.

In response to the SAB's finding that the State-owned toll bridges were an important element of the transportation system and therefore carry great importance to the State, the Department formed a Toll Bridge Peer Review Panel (Peer Review). The mission of the Peer Review was to review and guide the retrofit strategies under development for the State-owned toll bridges. The panel was comprised of experts from the fields of seismology, major bridge design, and construction.

The direction from these panels of experts to the Department was, at that time, and continues to be today, that the Department should proceed as quickly as possible, since we are *Competing Against Time*¹. As part of the actions to expedite seismic safety, preliminary studies including initial cost estimates were utilized to propose the financing outlined in SB 60.

¹ *Competing Against Time*, Report to Governor George Deukmejian from the Governor's Board of Inquiry on the 1989 Loma Prieta Earthquake, May 31, 1990

The Department has moved forward with an aggressive program to ensure that all bridges in California are seismically retrofit, including the State-owned toll bridges. The Department has seismically retrofit over two thousand bridges in California since the Loma Prieta Earthquake. There are only a handful of bridges remaining, the most complex technically and/or politically.

The toll bridges are the largest and most complicated bridges in the State. Nowhere in the world have bridges as complex as these been seismically retrofit. Variable soils and foundations, seismic forces ten times the original design forces, aged structures, heavy traffic volumes, conflicts with utilities, airspace concerns, handling of hazardous waste, and care to protect sensitive special aquatic, cultural, and historical resources all contribute to the difficulty in retrofitting these structures. Based upon the hazard and vulnerability studies and the SAB's input, the Department determined that the following seven of the nine State-owned toll bridges would need seismic retrofit:

Bay Area Toll Bridges:

- San Francisco-Oakland Bay Bridge
- Benicia-Martinez Bridge
- Carquinez Bridge (eastbound)
- Richmond-San Rafael Bridge
- San Mateo-Hayward Bridge

Southern California Toll Bridges:

- Vincent Thomas Bridge
- The San Diego-Coronado Bridge

In addition to retrofitting the above existing structures, it was determined that two bridges should be replaced:

- The East Span of the Bay Bridge;
- The westbound Carquinez Bridge (constructed 1927) which is funded by the Metropolitan Transportation Commission (MTC) using Regional Measure 1 toll funds (S&H Code, Section 30913).

For these two structures, replacement was determined to be the most cost-effective, long-term retrofit strategy.

Program Funding - SB 60 and SB 226

In August 1997, then-Governor Pete Wilson signed SB 60, establishing the funding plan for the seismic retrofit of the State's toll bridges, which states that:

“The department has determined that in order to provide maximum safety for the traveling public and to ensure continuous and unimpeded operation of the state's transportation network, six state-owned toll bridges are in need of a seismic safety retrofit, and one state-owned toll bridge is in need of a partial retrofit and a partial replacement.”

SB 60 recognized that the retrofit of the toll bridges was both a State and regional responsibility and a State and regional priority. Given the importance of public safety, the bill established an ambitious target for completion of the program:

“This article shall remain in effect only until the date the Director of Transportation certifies to the Secretary of Business, Transportation and Housing that all construction activities for the seismic retrofit or replacement of all state-owned toll bridges is complete, or June 30, 2005, whichever occurs first, and as of that date is repealed.” [S&H Code, Section 180.7]

SB 60, as modified by SB 226 (Chapter 328, Statutes of 1997), also established the \$2.62 billion funding for the program. The State share of funding for the Toll Bridge Seismic Retrofit Program is comprised of \$790 million from the Seismic Bond Fund of 1996 (Proposition 192) and \$875 million from the State Highway Account (SHA) and the Public Transportation Account (PTA). The regional share of funding is \$955 million; the \$907 million Bay Area portion of the \$955 million is from the toll surcharge.

To date, the \$790 million provided by the Seismic Retrofit Bond Act of 1996 (Proposition 192) has been fully allocated by the California Transportation Commission.

The San Diego Association of Governments (SANDAG) paid \$27.2 million on July 1, 2000, and it will contribute the remainder by the end of this fiscal year.

Tolls are no longer collected on the Vincent Thomas Bridge. The contribution from the Vincent Thomas Toll Bridge Account is to be paid when the balance in the account generates enough interest to total \$15 million.

A \$907 million local contribution to be generated by the \$1 dollar surcharge imposed on the state-owned Bay Area toll bridges includes \$80 million to cover the cost of a cable-suspended portion of the Bay Bridge East Span alternative. The \$907 million does not cover “amenities” which the Bay Area Toll Authority (BATA) has authorized. The Seismic Retrofit Surcharge (Surcharge) was established by SB 60. Section 31010 of the S&H Code reads:

“(a) There is hereby imposed a seismic retrofit surcharge equal to one dollar (\$1) per vehicle for passage on the bay area bridges, except for vehicles that are authorized toll-free passage on these bridges.

(b) This section shall remain in effect only until the date that the Secretary of State receives the notice required under subdivision (b) of Section 31050, or until January 1, 2008, whichever occurs first, and as of that date is repealed.”

TOLL BRIDGE SEISMIC RETROFIT FUNDING (\$\$ in millions)	
Source of Funds	Amount
<u>Proposition 192</u>	\$790
<u>Toll Bridge Seismic Retrofit Account</u>	
Regional Share:	
• Bay Area Surcharge Revenues*	\$ 907
• SANDAG Contribution	33
• Vincent Thomas Bridge Contribution	15
State Share:	
• State Highway Account	\$ 795
• Public Transportation Account	80
<i>Total State and Regional Share</i>	\$1,830
TOTAL FUNDS AVAILABLE	\$2,620

* Includes \$80 million for “signature” design cost (amenity).

SB 60 included a funding provision for a replacement East Span of the Bay Bridge that grants the MTC the authority to extend for up to two years the Surcharge for all State-owned toll bridges in the Bay Area. More importantly, MTC was identified as the regional agency responsible for selecting the new bridge design. Therefore, the Bay Bridge is unique because the State does not control the design process and is, in effect, acting as MTC’s contractor. Section 31015 (SB 226 as modified by AB 2038) of the S&H Code reads:

“(a) Revenues generated from the surcharge shall not exceed nine hundred seven million dollars (\$907,000,000), unless any of the following occurs:

- (1) After completing 30 percent of the design, and after completion of a cost estimate by the department, the authority selects a design that costs more than the cost of a single tower cable suspension bridge selected by the department.
- (2) The authority requests funding for the replacement or relocation of the transbay bus terminal in the City and County of San Francisco.
- (3) The authority requests funding for a bicycle or pedestrian access that is to be added to either the new east span of the San Francisco-Oakland Bay Bridge or the retrofitted west span of that bridge, or both.

(b) If the authority does any of the things listed in paragraphs (1) to (3), inclusive, of subdivision (a), the local share of the project costs shall be increased by an amount equal to any additional costs that are incurred as a result of the authority's decision.

(c) The department shall include the amenities requested by the authority only if sufficient funds generated by the seismic retrofit surcharge are made available to fully pay for those amenities.”

SB 60 anticipated that costs would likely exceed initially provided estimates, and provided an opportunity for the Department to report to the Legislature the increase in cost and a proposed financial plan to pay for that increase. Streets and Highways Code, Section 188.5 (c)(2) states:

“If the department determines that the actual cost of retrofit or replacement, or both retrofit and replacement, of toll bridges exceeds two billion six hundred twenty million dollars (\$2,620,000), which includes eighty million dollars (\$80,000,000) for cable suspension, the department shall report to the Legislature within sixty days from the date of that determination as to the reason for the increase in cost and shall propose a financial plan to pay for that increase and the Legislature shall thereafter adopt a financial plan therefor.”

The program’s financial status as of December 30, 2000, is summarized in the table on the next page. The figures include the surcharge revenues collected, transfers from the SHA and PTA, and expenditures from the Toll Bridge Seismic Retrofit Account (TBSRA) and Proposition 192.

This report is being submitted in accordance with the statutory requirements and lays out the amount of under funding and options to supplement the program.

TOLL BRIDGE SEISMIC RETROFIT PROGRAM FINANCIAL STATUS As of December 30, 2000 (\$ in millions)	
Revenues:	
◆ Toll Surcharge	\$357.1
◆ SMIF Interest	19.5
◆ Bond Revenue	558.8
◆ San Diego Association Government (SANDAG)	27.2
Transfers to TBSRA:	
◆ State Highway Account	231.2
◆ Public Transportation Account	10.0
Total Revenues and Transfers	\$1,203.8
Expenditures:	
◆ Capital Outlay	\$803.2
◆ State Operation	339.4
◆ PMIB Loan Interest	38.3
Total Program Expenditures	\$1,180.9

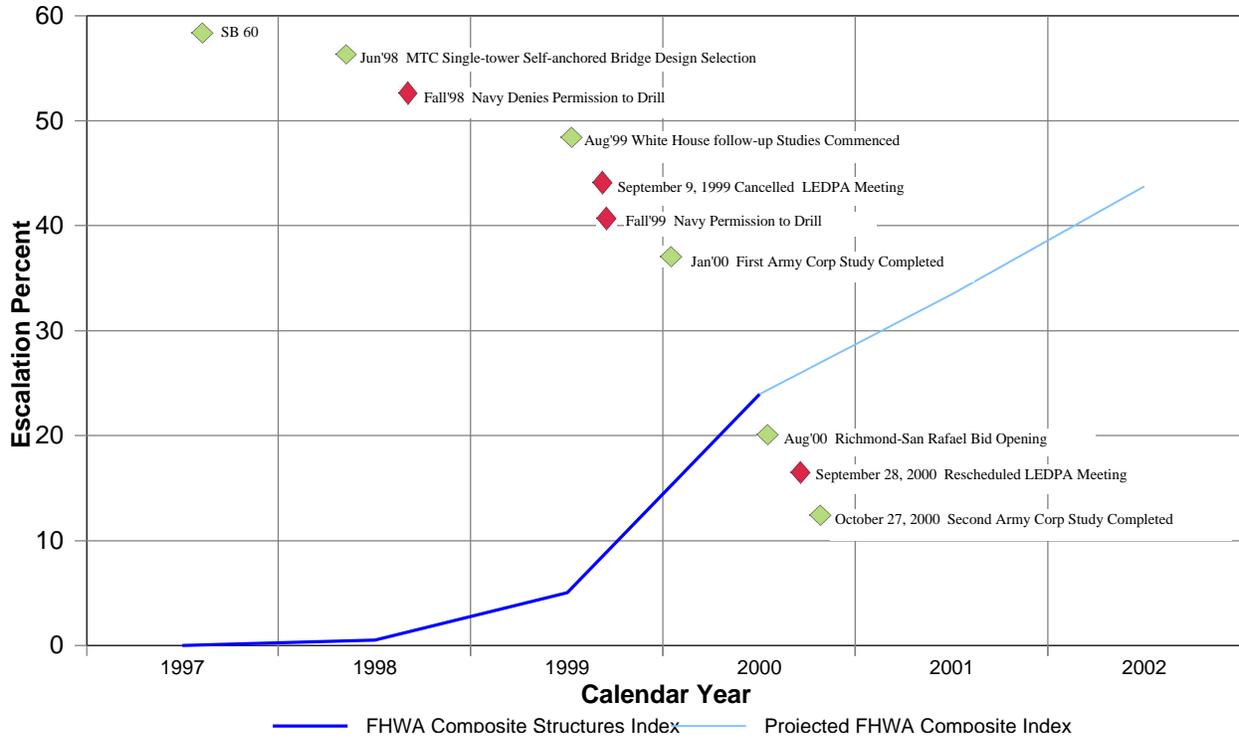
Program Challenges/Issues

The initial cost estimates were based on planning level studies and did not include appropriate contingencies consistent with the lack of refinement in the planning level studies and the uncertainties associated with this unique work. These initial cost estimates also did not include escalation. Several things have changed since these initial cost estimates that have resulted in cost increases above these initial estimates which were included in SB 60; the most significant of these changes are described below:

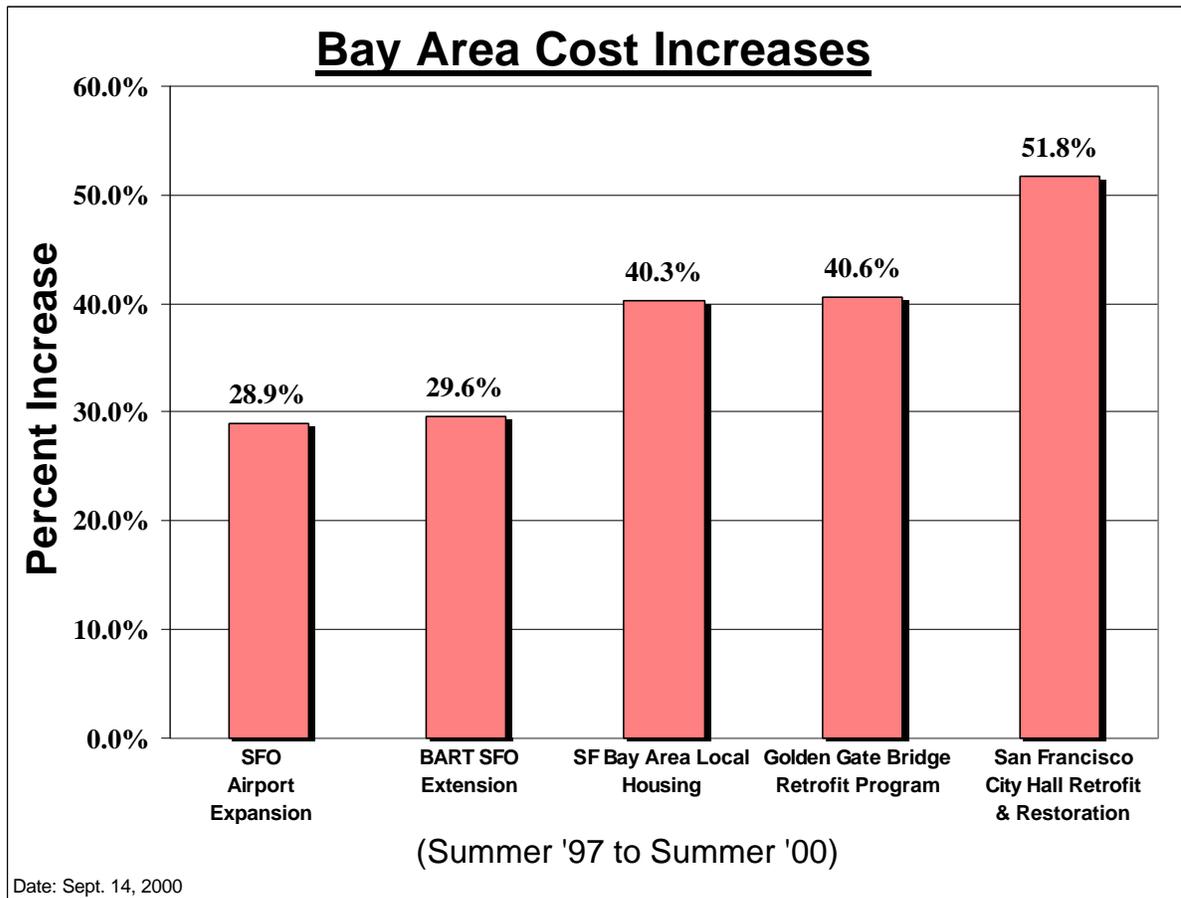
- The Federal Highway Administration’s (FHWA) construction cost index for structures (which indicates fluctuations in the prices of steel and concrete for large bridge projects) has increased from a 0.5 percent annual increase in FY 97-98 to an 18 percent annual increase in FY 99-00.
- The figure shown on the next page shows this increase and major milestone dates for seismic safety work on the Richmond–San Rafael Bridge and the San Francisco–

Oakland Bay Bridge East Span, as well as the date SB 60 was established. Therefore, delays have a significant cost effect on the program.

Impact of Delays Bridge Escalation Index



Note: Federal Highway Association (FHWA) Composite Index beyond the year 2000 is the average of the three prior years 1997 through 2000



- The economy in California is booming, especially in the San Francisco Bay Area. This unprecedented economic prosperity and record employment levels have resulted in higher construction costs. The figure above shows cost increases for other large Bay Area projects.
- The original support estimates (Note: “support” estimates include the cost of engineering, environmental studies and planning) for the toll bridge seismic retrofit projects were not refined estimates but rather were developed based on a percentage of the capital costs.
- The original capital cost estimates did not include adequate contingencies considering the complexity and uniqueness of the work and these original estimates did not include escalation.
- In keeping with the focus on safety, the Department accelerated the design and construction of the seismic retrofit projects whenever possible. While this allowed seismic safety to be achieved sooner, in some instances it resulted in additional costs.

Progress:

There are seven State-owned toll bridges that are scheduled for retrofit, the Bay Bridge and the other six bridges. Construction contracts have been awarded on all of these bridges. To date six construction contracts have been completed on these bridges; they are as follows:

- San Mateo–Hayward Bridge: Retrofit of existing trestle; Retrofit of West Approaches and Pier 1; Retrofit of the High Rise
- San Diego–Coronado Bridge: Retrofit of Main Structure; Retrofit of tower and foundation–Piers 24-32
- Vincent Thomas Bridge: Retrofit of Main Span and Approaches

Seismic retrofit work has been completed on two of the seven bridges; the Vincent Thomas and the San Mateo-Hayward Bridge seismic safety projects were completed in 2000.

Project Information:**Benicia-Martinez Bridge Seismic Retrofit**

Background: Constructed in 1962, the Benicia-Martinez Bridge carries Route 680 traffic over the Carquinez Strait between the cities of Benicia in Solano County and Martinez in Contra Costa County. Currently, over 90,000 vehicles cross the bridge each day. When completed in 1962, the bridge was constructed to an initial four-lane width of 67 feet. In 1991, the bridge was widened to its present width of 77 feet to accommodate six lanes of traffic.

Schedule/Cost: The SB 60 estimate for this project was \$101 million. The current total project cost estimate is \$190 million. The cost increase is a function of:

- The ground motions for the design of this retrofit have increased from the original ground motions used in the preliminary studies, which were the basis for the cost estimate in SB 60. The Peer Review concurred with these ground motion changes and supported the redesign to reflect these ground motion changes.
- Testing and manufacture of the seismic isolation bearings that are unique and unprecedented in size has delayed the project.
- Geological site conditions at a few pier locations are different from the geologic information available during the design. This situation has necessitated foundation redesigns at two piers.

The seismic retrofit of the Benicia-Martinez Bridge is approximately 85 percent complete. This work will be completed in 2001.

Carquinez Bridge Seismic Retrofit

Background: The two Carquinez bridges carry approximately 109,000 vehicles per day on Interstate 80 (I-80) across the Carquinez Strait between Contra Costa and Solano counties. The 1927 bridge now carries westbound traffic and will be replaced using Regional Measure 1 toll funds [S&H Code, Section 30913]. The eastbound Carquinez Bridge was built in 1958 as a part of the route's upgrade to interstate status. The eastbound bridge is being seismically retrofit pursuant to SB 60.

Schedule/Cost: The SB 60 estimate for this project was \$83 million. The current total project cost estimate is \$125 million. The cost increase is a function of:

- The contractor was delayed and had to re-sequence the construction work, because the Pacific Gas and Electric Company (PG&E) was late in relocating a 26-inch diameter high-pressure gas line from the south side of the bridge to the north side of the bridge. This gas line is a major supply line crossing the Carquinez Strait.
- The contractor was delayed and had to re-sequence the construction work, because the Union Pacific Railroad (UPRR) was late in relocating railroad tracks that conflicted with the contractor working at Pier 5.

The seismic retrofit of the eastbound Carquinez Bridge is approximately 85 percent complete. The project will be completed in 2001.

Richmond-San Rafael Bridge Seismic Retrofit

Background: The Richmond-San Rafael Bridge, completed in 1956, is a part of Interstate 580, spanning between the city of Richmond (Contra Costa County) and Point San Quentin (Marin County). The 4.5-mile long bridge, due to the structural inadequacies in its various portions, is vulnerable to a major earthquake.

Schedule/Cost: The SB 60 estimate for this project was \$329 million. The project was awarded to the low bidder at a cost of \$484 million and the total project cost is estimated at \$665 million. This project was awarded in October 2000 and construction will be complete in mid-2005. The cost increase is a function of:

- The project involves constructing approximately five miles of micropiles, mostly underwater within San Francisco Bay and large precast concrete "jackets" which will encase the existing foundations underwater. This work must occur in strong tidal currents. Estimating this underwater work has proved difficult. The Department's cost estimate for this portion of the contract was substantially lower than the actual bid amount.
- The strict environmental restrictions imposed on the project (for example, various portions of the bridge are not available to the contractor for up to six months of the year due to environmental restrictions) also affect the project cost. The necessary

work for completion of these portions of the project requires a duration of 12-18 months, and these restrictions will force the contractor into three cycles of marine mobilization and de-mobilization for this area.

- The construction was delayed while the Department reevaluated the design strategy to minimize traffic impacts and to avoid claims associated with concurrent construction contracts within the same work zone. The reevaluation resulted in changes in the design of the foundations and the sequencing of the work.

San Mateo-Hayward Bridge Seismic Retrofit

Background: The San Mateo-Hayward Bridge orthotropic steel spans were built in 1967. It carries 77,000 vehicles per day in both directions. The high-rise portion of this bridge has three lanes in each direction with no shoulders. The existing trestle or flat portion of this bridge has two lanes in each direction with no shoulders. The total bridge length is about 7.1 miles; the high-rise portion is almost two miles long, and the trestle is approximately five miles long.

Schedule/Cost: The SB 60 estimate for this project was \$127 million. The total project cost is estimated at \$190 million. The cost increase is a function of:

- This was the first toll bridge seismic retrofit project where the Department opened bids for work that involved erecting structural steel and structural concrete in a marine setting. Estimating this work proved difficult.
- Dredging operations encountered materials, which were not suitable for disposal under the regulatory permits.
- As part of the Department's focus on expediting safety, the retrofit design was based on the "as-built" drawings from the original construction of the bridge. Redesign was necessitated by field conditions differing from the "as-built" drawings.

The seismic retrofit work was completed in April 2000. The only remaining work is landscaping associated with mitigation commitments.

Vincent Thomas Seismic Retrofit

Background: The Vincent Thomas Bridge is a cable-suspension bridge built in 1963. The bridge is located on Route 47 and has four traffic lanes with 39,000 vehicles per day in both directions. The bridge is 6,062 feet long and consists of a main suspended span (1,500 feet by 59 feet wide), two side spans (approximately 507 feet long each), and east and west side approaches. The east and west approaches include ten spans of structural steel plate girders supported on concrete bents and are approximately 1,706 feet and 1,842 feet long, respectively.

Schedule/Cost: The SB 60 estimate for this project was \$45 million. The final project cost is \$62 million. The cost increase is a function of:

- As part of the Department's focus on expediting safety the retrofit design was based

on the “as-built” drawings from the original construction of the bridge. Redesign was necessitated by field conditions differing from the "as-built" drawings.

The seismic retrofit of the Vincent Thomas Bridge was completed in May 2000.

San Diego-Coronado Bridge Seismic Retrofit

Background: The San Diego–Coronado Bridge was opened to traffic in August 1969. The bridge is 2.12 miles long and consists of five lanes, with the center lane reserved as a safety median. The retrofit strategy does not adversely impact the aesthetics of the bridge and manages to preserve certain identified murals in Chicano Park.

Schedule/Cost: The SB 60 estimate for this project was \$95 million. The current total project cost estimate is \$105 million. The cost increase is a function of:

- Protection of a variety of operating businesses, residences, and a park adjacent to the bridge on the San Diego side.
- Protection of the various culturally significant art pieces within Chicano Park and the murals that have been painted on numerous bridge piers and adjacent structures.
- Additional mitigation measures that were required due to temporary impacts to Chicano Park.

The seismic retrofit work will be completed in 2001.

FUNDING THE \$557 MILLION SEISMIC RETROFIT SHORTFALL ON THE STATE CONTROLLED TOLL BRIDGES

Cost Summary

The current total estimated costs for the bridges discussed above (which does not include the Bay Bridge, a discussion of which is included later in the report) exceeds the funding provided for those bridges in SB 60 by \$557 million. SB 60 anticipated a funding shortfall and provided an opportunity for the Department to report to the Legislature the increase in cost and propose a financial plan to pay for that increase. Because the funding for this program is specified in statute, any funding solution requires legislation.

NON-BAY BRIDGE TOLL BRIDGE SEISMIC RETROFIT COST VARIANCE BY BRIDGE (\$ in millions)

	SB 60	Estimated Current Cost	Difference
Richmond-San Rafael Bridge	\$ 329	\$ 665	\$ 336
Benicia-Martinez Bridge	101	190	89
San Mateo-Hayward Bridge	127	190	63
Carquinez Bridge	83	125	42
Vincent Thomas Bridge	45	62	17
San Diego-Coronado Bay Bridge	95	105	10
TOTAL	\$ 780	\$ 1,337	\$ 557

Available Fund Sources

There are several fund sources that could be utilized to address the \$557 million funding shortfall. These include the State Highway Operations and Protection Program (SHOPP), the State Transportation Improvement Program (STIP), and the Highway Bridge Replacement and Rehabilitation (HBRR) funds.

State Highway Operations and Protection Program

The SHOPP includes projects necessary to maintain the integrity of the State Highway System, primarily associated with safety and rehabilitation without increasing the roadway capacity. The SHOPP is a four-year program of projects, approved by the CTC separately from the STIP cycle.

In the Bay Area, funds used from the SHOPP would be limited to those not previously earmarked for safety and emergency SHOPP projects. The available funds from the Bay

Area portion over the four-year SHOPP period, excluding emergency and safety projects, is \$311 million; this would require unprogramming SHOPP projects in the Bay Area.

In addition, \$10 million in San Diego County funds are available for the San Diego-Coronado shortfall, and \$17 million in Los Angeles County funds are available for the Vincent Thomas Bridge shortfall. This represents a total of \$338 million in available SHOPP funds.

Pros/cons

- This option could not supply funding for the entire shortfall. Therefore, a combination of funds or possible loans from other sources will be required.
- Does not delay delivery of safety and emergency SHOPP projects.
- Utilizes only funds otherwise directed to the Bay Area, San Diego and Los Angeles counties, rather than spreading the costs statewide.
- Delays the delivery of all non-safety and non-emergency SHOPP projects in the Bay Area for an extended period of time.
 - Redirects funding for pavement rehabilitation in the Bay Area. The Bay Area pavement rehabilitation projects are among the highest priority in the State.
 - Redirects funding for minor congestion relief and operations projects.
 - Redirects funding from landscape rehabilitation.

State Transportation Improvement Program

The primary source of funds for the STIP is the State Highway Account. The STIP is a five-year program list of regional and interregional transportation projects approved by the CTC on a two-year cycle. Funds used from the STIP could be limited to those not previously earmarked for STIP projects in the Bay Area, and could include funds made available by unprogramming Bay Area STIP projects.

The unprogrammed funds from the Bay Area portion of the 2000 STIP are approximately \$36 million. However, recent estimates from the Department of Finance (DOF) show an increase in the amount of Transportation Investment Fund resources available for STIP programming. The Bay Area portion of these funds is approximately \$74 million. In addition \$10 million in San Diego County funds are available for the San Diego-Coronado shortfall, and \$17 million in Los Angeles County funds are available for the Vincent Thomas Bridge shortfall; therefore, unprogrammed funds total \$137 million.

The balance of funds utilized from the STIP in the Bay Area would become available only from unprogramming projects.

Pros/cons

- Utilizes only funds otherwise directed to the Bay Area, San Diego and Los Angeles counties, rather than spreading the costs statewide.

- Work on some Bay Area STIP projects would be terminated, while other Bay Area STIP projects would be delayed.
- STIP programmed projects that have begun environmental or design phases would have an uncertain funding future.
- This would require MTC, San Diego Association of Governments, Southern California Association of Governments, and California Transportation Commission action.

Highway Bridge Replacement and Rehabilitation

HBRR Aid Program funds are Federal funds transferred to the State at a level of roughly \$300 million annually for the purpose of bridge replacement and rehabilitation. These funds are split 45 percent to the State, and 55 percent to local agencies. Utilizing the State's portion, with a reserve for urgent retrofit, approximately \$100 million annually would be available to fund the shortfall. The current available balance of State HBRR funds is \$250 million.

Pros/cons

- Project delivery in certain programs may need to be reduced in order to cover the Advanced Construction (AC) needs. Advanced Construction allows the State to borrow against future Federal funds.
- This option requires a multi-year commitment of bridge replacement funds and requires the Department to increase the desired balance of projects authorized under AC.
- This option could be used to fund the entire \$557 million shortfall.

Department of Transportation Recommendation

The Department recommends authorization to utilize HBRR funds to fund the \$557 million seismic retrofit shortfall on the state-controlled toll bridges. Use of HBRR funds will have the least impact on the State budget, and will fund the entire shortfall through a multi-year commitment of federal bridge replacement funds.

This funding recommendation does not address the Bay Bridge.

SAN FRANCISCO TO OAKLAND BAY BRIDGE

On October 17, 1989, the Loma Prieta earthquake damaged the Bay Bridge. The damage to the Bay Bridge included collapse of the upper and lower decks spanning pier E9 and failing support pier to superstructure connections at several piers, threatening multi-span collapse.

Progress

To date six construction contracts have been completed on the Bay Bridge; they are as follows:

- Bay Bridge East Span: Retrofit of Eastbound Approach – Piers E23-E39; East Span Interim Retrofit²; and Pile Installation Demonstration
- Bay Bridge West Span: Retrofit of Upper Westbound Approach – Bents 54-57; Retrofit of Westbound Caissons – Piers W2-W6; Retrofit of Yerba Buena Island Approach

Background

Nowhere in the world have bridges as complex as the State-owned toll bridges been seismically retrofit. As the first step, a research phase was undertaken employing researchers from academia and private practice to define the appropriate ground motions and strategy to retrofit the Bay Bridge. As the research studies and early design efforts provided information that allowed a retrofit design to evolve, it became apparent that it was not rational or possible to retrofit the East Span of the Bay Bridge to a “lifeline³” criteria. It became apparent also that the cost associated with retrofitting the East Span of the Bay Bridge to a “lack of collapse” standard was approaching the cost of a full replacement.

On January 10, 1997, the then-Secretary of Business, Transportation and Housing Agency Dean Dunphy signed a recommendation to then-Governor Wilson to consider a replacement of the East Span of the Bay Bridge as a project alternative. The then Secretary’s statement included a recommendation that:

“Expedite an interim retrofit for the east bay spans to avoid collapse in the less than maximum but more likely seismic events.”

² The purpose of the East Span Interim Retrofit is to protect the existing bridge from a more likely to occur, yet smaller magnitude earthquake. It increases the level of safety while the Bay Area debates the Bay Bridge East Span Seismic Safety Project. It does not protect the bridge from a significant seismic event.

³ “Lifeline” refers to structures that have been designed to a higher standard so that they will function after an earthquake. Most structures are not lifelines; they are designed to avoid collapse and catastrophic failure, but not to provide their function.

This recommendation arose out of concerns that the Bay Area might have difficulty in making decisions regarding the various design features for a new East Span.

In June 2000, the Department completed (while working around traffic) this Interim Retrofit of the Bay Bridge East Span. The purpose of this work was to reduce the risk to the public of a moderate level earthquake (magnitude 6) prior to the construction of the New East Span.

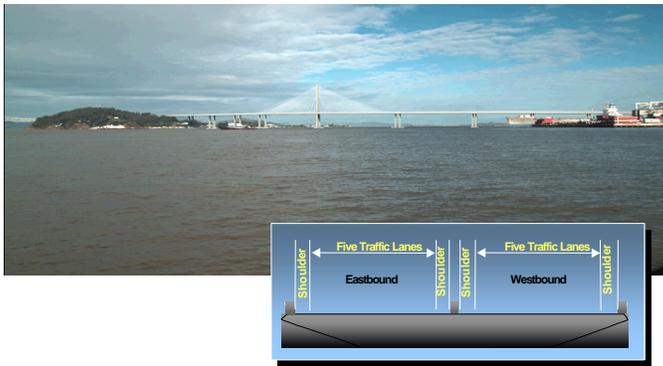
The Interim Retrofit provides protection from collapse of the Bay Bridge if the Loma Prieta earthquake occurred again (the epicenter was in Santa Cruz). However, if this level earthquake occurs closer to the Bay Bridge, then the Interim Retrofit will not protect the bridge from collapse.

It is important to note that on the basis of research conducted since the 1989 Loma Prieta earthquake, the United States Geological Service (USGS) concludes that there is a 70 percent probability of at least one magnitude 6.7 or greater quake, capable of causing wide spread damage, striking the San Francisco Bay region before 2030. Major quakes may occur in any part, and at any time, of this rapidly growing region.

Such an earthquake could cause collapse of the existing East Span and the West Approach to the Bay Bridge.

SB 60 provided \$1.285 billion for the basic new East Span. It consisted of a single viaduct structure with a cable supported element near Yerba Buena Island. SB 60 gave the Bay Area (MTC) the authority to fund various amenities, including a more distinctive bridge and a bicycle/pedestrian path on the bridge, and discretion to extend the toll

surcharge for up to two years. While the Department had the decision-making role in the other toll bridge seismic retrofit projects, the Department's role in the Bay Bridge was different. SB 60 removed much of the decision-making role from the Department and provided this role to MTC.

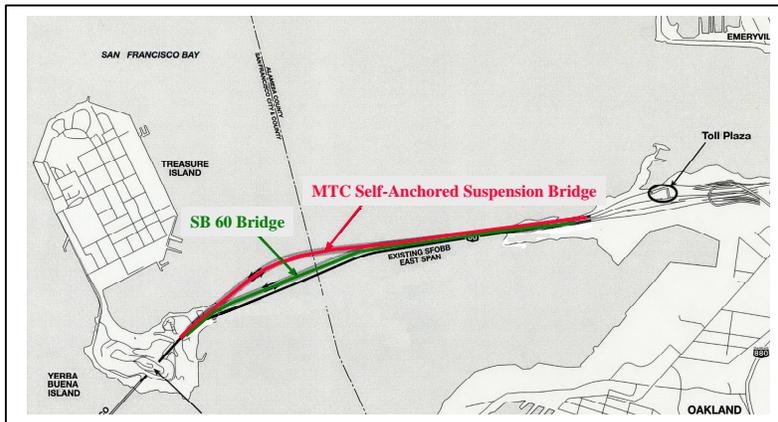


The Department entered into an Architectural and Engineering (A&E) contract with a Joint Venture (TY Lin and Moffatt & Nichol) to design the new Bay Bridge in January 1998. This was prior to MTC choosing a bridge and prior to the numerous additional studies related to this bridge.

MTC selected a bridge type and alignment and amenities in June 1998. The Department is completing design on the Skyway but is stopping design on the Self-Anchored Suspension (SAS) portion of the bridge pending an amendment to the design contract

with the Joint Venture. Due to the funding shortfall, there is not enough funds authorized to construct the MTC-selected design. The Department has adequate funds to complete the design, but the Department does not believe it is prudent to spend the funds completing the design if there is inadequate funding to construct the MTC-selected design. The Department seeks the Legislature’s concurrence for the expenditure of funds to complete the design of the new East Span design prior to the resolution of the funding shortfall.

MTC selected the bridge depicted. MTC chose to separate the two directions of traffic into separate structures for the viaduct, which is more costly and less efficient than the bridge envisioned in SB 60. MTC also selected the SAS near Yerba Buena Island, one of the most costly bridge types possible.



The self-anchored suspension bridge is on an alignment that is longer than the SB 60 bridge alignment. This longer alignment is required to accommodate the unique self-anchored suspension bridge.



MTC chose to fund a bicycle/pedestrian path that is 15.5 feet wide and is located one foot above the roadway level. For comparison, the Dumbarton Bridge has an 8-foot wide path. The Department standard 2-way bicycle path width is 12 feet. MTC also chose to compliment this bike path with a half dozen lookouts (referred to as “belvederes”).

After these decisions were made, the project experienced delays.

In the fall of 1998, the Department formally requested permission from the United States Navy (Navy) to drill a series of four-inch diameter holes into the underlying soil and rock on Yerba Buena Island. This written request included an environmental clearance and all the necessary permits for this work. The Navy denied this request.

The Department needed permission from the Navy to collect this subsurface geologic information, because a portion of Yerba Buena Island is part of Naval Station Treasure Island, a closed military base. This geologic information is a key parameter for the design of the East Span of the Bay Bridge. By contrast, the United States Coast Guard (Coast Guard) granted the Department’s initial request to collect the necessary subsurface geologic information on the portion of Yerba Buena Island controlled by the Coast Guard. The Coast Guard operates a 24-hour a day search and rescue mission on Yerba Buena Island, while the Navy’s portion of Yerba Buena Island houses a closed military facility.

The Navy finally granted permission for drilling on Yerba Buena Island in the fall of 1999. This resulted in a delay of more than one year.

There are many steps associated with obtaining the environmental compliance and the necessary regulatory permits for the Bay Bridge East Span. A key step in the Environmental Impact Statement (EIS) [NEPA/404] integration process is the identification of the Least Environmentally Damaging Practicable Alternative (LEDPA). The Department was scheduled to meet with the FHWA, U.S. Environmental Protection Agency, and the U.S. Army Corps of Engineers on September 9, 1999, as part of the LEDPA identification process. This meeting was postponed while a series of six steps (including a study of San Francisco's modified S-1 alignment) were completed, so that all the Federal agencies, including the Department of the Navy, had a single, unified position

regarding this project. The LEDPA meeting finally occurred in the fall of 2000, over one year after the originally scheduled date. This delayed the Final EIS.

This resulted in a total delay to the project of two years (one year due to the delay in obtaining permission from the Navy to drill on Yerba Buena Island, plus the one-year the environmental process was on hold). The inflation (or escalation) resulting from this two-year delay has had an impact on the cost of the project.

The FHWA's construction cost index for structures (which indicates fluctuations in the prices of steel and concrete for large bridge projects) has increased from a 0.5 percent annual increase in FY 97-98 to an 18 percent annual increase in FY 99-00. The figure shown on page ten of this report shows this increase and major milestone dates. Schedule delays have a significant cost effect on the Bay Bridge.

The Final EIS will be published within the next month, and will be circulated for public comment for 30 days. The Department and FHWA will issue a Record of Decision (ROD), which addresses any comments and is the final legal decision pursuant to NEPA. The ROD is the legal decision document that selects the alternative that will be built. The ROD is scheduled for Spring 2001.

The ROD selects an alignment alternative with a design variation along that alignment. Prior to the selection of the ROD, any cost estimate makes an assumption regarding the outcome of this legal decision making process. Without a ROD there is no project. The Department is prepared to advertise the construction contract for the viaduct portion of MTC's bridge once the ROD is filed.

The Department has updated the cost estimate for the MTC East Span in anticipation of the ROD. The current cost estimate for the MTC East Span is \$2.6 billion, assuming a 5 percent escalation rate.

In order to compare impacts of type selection decisions associated with the Bay Bridge East Span, three scenarios and resulting alternatives are considered. The alternatives are measured in time and cost.

The first scenario considers cost and schedule estimates if the Department's Skyway/Viaduct alternative recommended in 1997 would have been advanced to construction and seismic safety as soon as possible. The 1997 cost estimates are escalated through time at 10 percent, matching historic data from the booming economy of that time. Two and one half years are assumed for the design and advertisement phases initiating at midyear in 1997. This alternative does not add the sunk costs for all the studies and support dollars spent to date on the current MTC design. This cost does not include the seismic retrofit of the West Span and the West Approach.

The second scenario considers cost and schedule for the current MTC design (including sunk costs and the interim retrofit), escalated at 5 percent per year from the date of the latest cost estimate data to the construction bid opening for each contract. This alternative assumes no additional amenities or design features, costing time or money, are added to the bridge beyond its current design iteration. This cost does not include the seismic retrofit of the West Span and the West Approach.

The third scenario considers cost and schedule for the current MTC design, enhanced with additional amenities and features that the Bay Area is currently considering (e.g., light pipe, West Span bikepath, etc.). Cost estimates are escalated through time at 5 percent per year from the time of the latest estimate data to construction bid open. An additional six months of design iteration is assumed to define exact details of the additional architectural amenities and features. This cost does not include the seismic retrofit of the West Spans and the West Approach.

The current DOF escalation rate is 3.5 percent. This DOF 3.5 percent rate is used for projects in the STIP. Recognizing the current state of the Bay Area economy and the fact that the Bay Area is experiencing a level of bridge construction unprecedented since the 1930s, this 3.5 percent DOF rate has been increased to 5 percent in the calculation of this cost estimate. Based on recent history, this 5 percent rate may underestimate future costs.

The following table summarizes the three scenarios for the East Span defined above. The “time to seismic safety” is the projected date in the future when both west and east bound traffic has been moved onto a new structure. The summary table illustrates the currently projected impacts in cost and schedule of the delays and the uniqueness of the design selected by the Bay Area.

COST OF EAST SPAN SCENARIOS

Type Selection Scenarios	Date of Seismic Safety	Escalated Costs (Billions)
(1) 1997 Skyway/Viaduct ⁴	December 2003	\$1.6
(2) Current MTC Design	November 2006	\$2.6
(3) Enhanced MTC Design	May 2007	\$3.2

The \$2.6 billion cost estimate for the MTC design includes all costs incurred to date (e.g. the interim retrofit and numerous additional studies) along with the costs projected for the MTC selected design. The estimate includes inflation due to project delays, the cost of engineering, environmental document, numerous extra studies, design costs, right-of-way, utilities, environmental mitigation, interim retrofit, cost of original retrofit design (sunk costs), the anticipated construction bids, and appropriate contingencies to address potential construction issues.

⁴ This scenario is no longer viable within the identified time frame.

The \$2.6 billion cost estimate for the MTC selected design does not include other “amenities” that the Bay Area desires which are acknowledged by the Bay Area as being beyond its current authority. While acknowledging cost increases, the Bay Area still seeks these additional changes. This sentiment was expressed formally by MTC. On December 13, 2000, MTC sent a letter to the Department requesting additional elements be added to the New East Span which will also increase costs. These items are:

- Whiten the bridge (the Department previously denied MTC’s request that the Department utilize white cement which costs considerably more than conventional cement);
- Light pipe (MTC desires this aesthetic lighting element which would run along the entire length of both sides of the two mile long structure); and
- Steel bicycle/pedestrian path for its entire length (in a desire for economy the Department designed a portion of the bike path as a concrete facility).

In its December 13, 2000, letter to the Department, MTC states:

“...we will seek funding for this design enhancement in the context of the expected legislative deliberations next year on providing additional funding for the overall toll bridge seismic retrofit program.”

If these amenities were also added, plus a bicycle and pedestrian path on the West Span, the estimated cost of the Enhanced Bay Bridge would be \$3.2 billion, assuming a 5 percent escalation rate.

One of the many additional studies prepared for this project is the recent U.S. Army Corps of Engineers Report. This independent study noted the additional costs associated with the Bay Area’s amenities. The Report states:

“...increased cost is due primarily to the addition of the signature span and amenities...”

West Span and West Approach

- Due to the importance of the Bay Bridge to the region’s economy and transportation system, it is essential that all lanes on the Bay Bridge West Span and West Approach remain open during peak commute hours. The West Approach is located in a vibrant neighborhood with both commercial, industrial and residential land use immediately adjacent to the freeway. As a result, the construction staging in the Bay Bridge West Approach is very complex. The construction staging limits various construction activities to “work windows” which strike a balance between local community concerns (San Francisco) and regional mobility needs. Achieving consensus on these “work windows” has delayed the project.

- In addition, the City and County of San Francisco (San Francisco) has changed its position on the location of the new Transbay Transit Terminal (TTT). San Francisco now supports using the existing TTT location for the new facility, and previously supported building the new TTT at Main and Beale Streets. San Francisco's reversal may affect the planned removal of the east loop of the existing facility, which is part of the seismic retrofit of the West Approach of the Bay Bridge. The Department's focus is safety and it is a regional decision whether to keep this extra loop. Additional cost would be associated with this change.

Summary

While the Department had the decision-making role in the other toll bridge seismic retrofit projects, the Department's role in the Bay Bridge was different. SB 60 removed much of the decision-making role from the Department and provided this role to MTC. MTC has exercised this role. The Department has implemented the Bay Area's desires as communicated by MTC.

The total cost for the Bay Bridge (current MTC design for the East Span, plus the West Span and West Approach work) is \$3.3 billion. This cost estimate does not include the cost of additional amenities which the Bay Area may wish to fund under existing law, such as a bike path on the West Span of the Bay Bridge, and a new Transbay Transit Terminal.

However, if all of the desired amenities were added to the Bay Bridge (e.g. white cement, four miles of "light pipes" and a bicycle and pedestrian path on the West Span) the total cost of the Bay Bridge (East Span and West Span) would be \$3.9 billion, assuming a 5 percent escalation rate.

The Department has proceeded with an "at risk" design on the MTC East Span alternative (includes the SAS and East Span bike path, but not the light pipe or white cement) plus the West Span (but not the West Span bike path or the Transbay Terminal) and West Approach retrofit, to achieve safety sooner and to minimize inflationary cost increases associated with project delays. The cost estimate of this work is \$3.3 billion (\$2.6 billion East Span and \$700 million for the West Span and West Approach), assuming a 5 percent escalation rate.

The shortfall for the Bay Bridge is \$1.32 billion. It is imperative that the region identify ways to allow this work to move forward in a timely fashion.